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# References to the Neurosciences in Three Relational Psychoanalysts: Arieti, Bowlby and Fromm

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## Introduction

This paper was presented at the Sixteenth AAPDP/OPIFER Joint Meeting, which took place in Pistoia, Italy, on October 22-23, 2016.

The meeting aimed at creating connections between two areas of research: mind and brain. The distinction between mind (*res cogitans*) and brain (*res extensa*) goes back in recent philosophy to Descartes. He thus completely separated mind and brain and created a misleading dichotomy that still haunts the study of man (Alexander and Selesnick 1966).

My paper is a historical contribution on the views of three authors on the subject of mind and brain. My paper's title implies the distinction between the original Freudian drive model and the relational model in psychoanalysis, whereby a basic need of a child is relatedness. This distinction was first established by Greenberg and Mitchell (1983) in their book, *Object Relations in Psychoanalytic Theory*. Greenberg and Mitchell consider Sándor Ferenczi to be the initiator of the relational model. Of the three authors I discuss, Bowlby and Fromm are both placed by Greenberg and Mitchell within the relational model. Though Arieti is not mentioned by them, through his training at the William Alanson White Institute in New York, where, as he himself says (Witenberg 1978), he was chiefly influenced by Frieda Fromm-Reichmann, he belongs firmly within the interpersonal-cultural school, which antedated the relational model, as Greenberg and Mitchell acknowledged by placing Sullivan and Fromm, the two leaders of the school, within the relational model.

A further distinction is that between Arieti and Bowlby, on the one hand, and Fromm, on the other. Arieti and Bowlby were both MDs and psychiatrists, and their basic training was therefore in the natural sciences, while Fromm was by training a sociologist, and only towards the end of his life did he turn to ethology and the neurosciences in order to write *The Anatomy of Human Destructiveness* (Fromm 1973a). This was a most impressive achievement on his part.

Fromm and Arieti were both European Jews who, after the advent of Nazism, sought refuge in the United States, Fromm in 1934 and Arieti in 1939.

Fromm (the eldest of the three, born 1900) was one of Arieti's teachers at the WAWI, alt-

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hough, as I indicated above, Arieti was more influenced by Fromm-Reichmann. Arieti (the youngest of the three, born 1914) valued Bowlby's attachment theory, and the two authors cooperated when Bowlby wrote a chapter for the second edition of the *American Handbook of Psychiatry*, of which Arieti was Editor-in-Chief (Bowlby 1975). This chapter is not often quoted, but it is a very useful synthesis of attachment theory. Bowlby, who was of an intermediate age (born 1907), was not familiar with Fromm's work, but also Fromm, like Arieti, was very appreciative of attachment theory and had annotated his copy of Bowlby's *Attachment*. Neither Arieti (who died prematurely in 1981) nor Fromm (who died in 1980) lived to comment on the completion of Bowlby's trilogy in 1980 (Bowlby 1969, 1973, 1980), nor on the incorporation of PTSD into DSM-III in the same year, which recognized the importance of real-life traumatic events, to which the infantile psyche reacts by dissociation. Bowlby, instead, right at the beginning of *Attachment* (Bowlby 1969, p. 4), stated that "the perspective adopted here […] starts […] with the traumatic experience".

All three authors were strongly influenced by Darwin's evolutionary theory, and, as I shall show, shared in various ways an interest in the neurosciences. In an earlier paper (Bacciagaluppi 2009) I pointed out the importance of Darwin for both Arieti and Bowlby.

The three authors also shared an interest in philosophy. Philosophy was part of Fromm's training (one of his teachers in Heidelberg was Karl Jaspers). Arieti and Bowlby were concerned with the philosophical underpinnings of their work. Arieti's philosophical interests reached a peak in a section of *The Intrapsychic Self* titled "The biological origin of knowledge" (Arieti 1967, p. 196), where he states that Kant's categories of time and space are *a priori* for the individual but *a posteriori* for the human species. Bowlby also discussed philosophical problems in a section of *Attachment* (Bowlby 1969, p. 106). Here he cited a concept of the philosopher Suzanne Langer, that what is felt is a process within the organism, a phase of the process itself, as when heated iron becomes red (p. 108), and is not a quality added to it. In *The Intrapsychic Self* also Arieti discusses Langer, in connection with the origin of language.

One trait in common to Bowlby and Fromm was a due regard for Freud. Although they had a critical attitude, they also regularly consulted the *Standard Edition*.

Bowlby was often in the USA. He probably found the interpersonal-cultural school more congenial than Freud and Melanie Klein.

Finally, I had a personal relationship with Arieti and Bowlby. Together with my first wife, I studied with Arieti in New York in 1963-64, and we later translated three of his books (*The Intrapsychic Self*, *Creativity,* and *Severe and Mild Depression*, co-authored with Jules Bemporad) into Italian. I kept up an eight-year correspondence with Bowlby, from 1982 to 1990 (the year he died), and also met him once in London to discuss a paper of mine. This correspondence has now been published (Bowlby 2013). Fromm I never met, but I read his works closely and published many papers about him.

**Silvano Arieti**

Arieti, after anti-Jewish laws were passed in Italy in 1938, escaped from Italy to the United States in 1939, shortly after his graduation from medical college. In America he worked in neu-

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ropathology with Armando Ferraro before moving to clinical psychiatry. He became perhaps the most famous American psychiatrist of his time. He edited the *American Handbook of Psychiatry*, the first edition of which appeared in three volumes in 1959-66. The second, greatly expanded edition, appeared in eight volumes, in the 1970's and 1980's. The last volume, *Biological Psychiatry*, was published in 1986, after his death.

Arieti was renowned as a specialist in schizophrenia. His classic work, *Interpretation of Schizophrenia*, appeared in 1955. The second, expanded edition, was published in 1974. In Chapter 21 of the first edition (Chapter 30 of the second edition) he presents his views on the role of the central nervous system in schizophrenia. They advance the stimulating hypothesis of psychosomatic involvement of the CNS. "The central nervous system would be the victim of the psychological conflicts that it produces" (second edition, p. 474). Arieti leaves aside the possibility of a primary pathology of the CNS. He does not take up which parts of the nervous system are diseased, but which parts are functioning when a patient has ideas of reference, delusions, hallucinations, and so on. These symptoms are produced in the cerebral cortex.

Certain areas of the CNS are not involved in psychopathology. The patient is capable of moving, seeing, hearing. Two areas that are involved are the PF (prefrontal) and TOP (temporal, occipital and parietal) areas. These were the last to appear in phylogeny and are the last to myelinize in ontogeny. "These are the areas where neurology and psychology coalesce" (*Interpretation*, first edition, p. 414). The archipallium, which is more ancient, is only secondarily involved.

In a broad sense, the temporal, occipital and parietal lobes are the primary receptive areas, where stimuli coming from the external world receive various levels of elaboration, from sensations to perceptions to the recall of the past through images. The TOP area, in a narrow sense, comprises parts of the three lobes where stimuli are associated and elaborated to high symbolic levels. The blood supply of this area comes from all three cerebral arteries. Since higher symbolization goes together with socialization, close association between the TOP area and the centers of language is necessary.

The prefrontal areas use the data from the temporal, parietal and occipital lobes to achieve planned, logical thinking. But the psychological processes occurring in the PF area are those capable of evoking very great anxiety. As Arieti says on p. 420 of the first edition of *Interpretation*, the prolonged childhood characteristic of the human race leads to an "absolute need for interpersonal relations". If these relations are painful, great anxiety may ensue, and higher symbolic functions, since they perpetuate anxiety, are avoided. There is a withdrawal from the abstract to the concrete, from socialized symbols to paleosymbols, from logic to paleologic. There is a regression to, but not an integration at, lower levels of thinking, and hence an increasing regression. Here is a clinical example of the concretization of a concept, taken from *The Intrapsychic Self* (Arieti 1967, p. 271): a patient who felt at first that his wife was poisoning his life, later felt a bad taste in his food and experienced the delusion that his wife was poisoning his food.

In the second edition of *Interpretation* (Arieti 1974, p. 474), Arieti states that he is considering "the possibility of a functional alteration of the nervous system in schizophrenia […], not at a biochemical or molecular level, but […] as a disintegration of usual neuronal patterns".

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In his later book, *Severe and Mild Depression* (Arieti and Bemporad 1978), his co-author, Jules Bemporad, in a critical review of the major concepts of depression, examines the physiological theories that regard depression as a basic emotion having both psychological and physiological correlates. These studies started with the observation that hypertensive patients treated with reserpine developed episodes of depression, by depleting the brain of norepinephrine (NE) and serotonin, or 5-hydroxytryptamine (5-HT). At the same time, researchers observed that some tubercular patients treated with isoniazid showed elevations of mood, because isoniazid blocks the destruction of NE and 5-HT by inhibiting monoamine oxidase (MAO), that metabolizes these amines. The beneficial results of tricyclic antidepressants such as imipramine result from a blockage of the re-uptake of NE at nerve endings. Lithium, on the contrary, enhances the re-uptake of NE. An excess of these amines leads to mania, a depletion to depression. Clinical observations in the field of depression thus contributed to modern neuroscience.

All told, Arieti consistently tried to give neurobiological underpinnings to his clinical observations.

**John Bowlby**

Bowlby is the author of attachment theory, now widely accepted by the scientific community. Attachment theory was built upon the clinical observation of the three phases of a child's reactions to prolonged separation from the mother: (1) protest, impelled by the anger of hope that the protest will make the mother return; (2) despair, which is fuelled by the anger of despair, if the mother does not return; and, finally, (3) emotional detachment.

Bowlby says that attachment behavior in the young was selected in the course of evolution because of its survival value, which consists in the defence from predators, as distinct from the provision of nourishment, as Freud had held. This is the ethological underpinning of attachment theory. Bowlby points out that attachment behavior is in common to all mammals and to many birds, although, on p. 183 of *Attachment*, he is careful to point out that birds and mammals belong to two different lines, and that one may speak only analogically. The theory, which applies to many different species and even to different classes of animals, has a time dimension of millions of years, and is thus a most powerful theory in the field of psychoanalysis.

Coming from "Cambridge natural science", as he used to say, Bowlby (1969, p. 37) lists neurophysiology ("Freud's own first love"), along with ethology and experimental psychology, among the three empirically based sciences making recent breakthroughs. "The three complement one other", "and at last the principles of a unified behavioural science are beginning to emerge". Bowlby, by developing attachment theory, may be viewed as having made a decisive contribution to this unified science.

Here follow some examples of this interest of his in neurophysiology, which was integrated into the basic ethological framework.

On p. 84 of *Attachment* he says: "The neural equipment of higher species incorporates within itself all the earlier design features and then adds to it new systems". Similarly, "in the early infancy of man most of the behavioural systems in working order are simple ones and integrated as chains".

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On p. 88 he speaks of causal hierarchy. For example, electrical stimulation of the brain stem of chickens elicits a number of behavioral units.

On p. 96 he says that "if a specific stimulus is to be responded to by behaviour, the mammalian cortex must be in a state of arousal (as measured by EEG), and shows also that the condition of the cortex is in great measure determined by the condition of the brain-stem reticular formation, which, in turn, is much influenced by the total stimulation received by the animal, irrespective of sensory mode". "There is an optimum level of sensory input", below or above which efficiency is diminished.

On p. 102 he says that sensory input is assessed. If judged relevant, it is forwarded. This is followed by efferent messages. In man, such assessment may be conscious and lead to value judgments, such as "pleasant" or "unpleasant".

On pp. 106-108 Bowlby discusses the philosophical problem of the relation between brain and mind. According to the mentalist school, stemming from Descartes, to which Freud belonged, the brain and the mind engage in distinct activities. According to others, only the physical world is real, and mind is an epiphenomenon, something added on. As already stated, Bowlby subscribes to a third position, derived from Langer, whereby feeling is a phase in a process, as when heated iron becomes red.

In Chapter 10 of *Attachment* (p. 145), which addresses the ontogeny of instinctive behavior, Bowlby states some general principles.

(1) In the course of ontogeny, there is a restriction of the range of effective stimuli. "A human infant of a few weeks responds with a smile to any visual stimulus that has two black dots on a pale background; by three or four months a real human face is required" (p. 149). "The stimuli that elicit approach behaviour tend to become restricted to the familiar" (p. 151).

(2) Primitive behavioral systems are superseded by sophisticated, goal-corrected systems. This results from the growth of the central nervous system. On p. 156 he remarks that in the first month of life the neocortex is little developed. During the third month some parts become functional and responses can be delayed. "Nevertheless, throughout the first two years of life the development of the elaboration areas of the neocortex lags far behind that of the primary projection areas". "Only towards the end of the preschool years are most children able to make a choice". This corresponds to Arieti's remarks on the relationship between PF and TOP areas.

(3) Behavioral systems become integrated into functional wholes. For example, in the rhesus monkey sexual maturity is not reached until a certain age, but fragments of sexual behavior are seen from the earliest weeks.

Neurophysiology is thus the main addition that Bowlby integrates into the basic ethological and evolutionary framework to support his theory.

In this paper I only discuss the references which Bowlby himself makes to the neurosciences. Later, many more additions in this area were made to attachment theory. For instance, a recent description of the attachment relationship in neurobiological terms is provided by Schore (2011), according to whom the mother-child communication occurs through the two right

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hemispheres.

**Erich Fromm**

As already mentioned, before training in psychoanalysis, Fromm trained in classical sociology, then turned to the critical sociology of the Frankfurt Institute for Social Research. Towards the end of his life, in his late sixties, he turned to the natural sciences in order to write *The Anatomy of Human Destructiveness* (Fromm 1973a), to refute what he termed the "hydraulic model" of Freud and Lorenz, whereby aggressiveness wells up inside a person.

In the Preface, Fromm states that, in addition to psychoanalysis, he felt the need for knowledge in other fields, such as neurophysiology, animal psychology, paleontology and anthropology, although he acknowledged his initial lack of competence, especially in the neurosciences.

In the Introduction he draws a fundamental distinction between benign, defensive aggression in the service of survival, and malignant, destructive aggression, which is specific to the human species.

In Part Two (The Evidence Against the Instinctivist Thesis), Chapter Five is devoted to neurophysiology. Here Fromm distinguishes between psychology, the science of the mind, and the neurosciences, the sciences of the brain. These sciences should remain in close contact. "The findings of one can be related to those of the other". He thus shares with Bowlby the aim of attaining a unified science, which in a footnote he calls the *science of man*.

Fromm examines the brain as a source of aggressive behavior, the main concern of his book. Neurophysiologists have concentrated their efforts on locating the brain areas that are the substrates of the most elementary behaviors needed for physical survival: feeding, fighting, fleeing. The brain is organized as a dual system of activation and inhibition. The affective reactions of rage and its corresponding aggressive behavior can be activated by direct electrical stimulation of various areas, such as the amygdala, and can be inhibited by stimulating other structures.

Neurophysiologists also observe the effects produced by the destruction of certain areas. Fromm cites the classical experiment by Klüver and Bucy, in which destruction of the amygdala made animals lose their capacity for aggression. Fromm views the defensive function of aggression as a response to a threat to the vital interests of the animal. Another reaction is fear leading to flight. Both kinds of behavior are elicited in cats by the electrical stimulation of the hypothalamus, in areas which are close together. In human history, "the repression of the flight impulse and the apparent dominance of the fight impulse is largely due to cultural rather than to biological factors".

Another kind of aggression, that has a distinct neurological basis, is found in predatory land animals. This behavior does not show rage, and its aim is not defensive but finding food. This is called instrumental aggression, in the service of a goal. Humans are nonpredatory, though they have domesticated predatory animals, such as the dog and the cat. The dog was originally used to hunt other animals and to defend sheep against wolves, and the cat to hunt mice.

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Fromm concludes this section by saying that neurophysiological data do not deal with the aggression unique to mankind and not shared with other mammals - the propensity to kill and to torture as goals in themselves. As stated above, he does not share Freud's and Lorenz's "hydraulic" model, which views human destructiveness as innate and welling up inside. Human destructiveness results from unnatural living conditions. The model is that of animals living in captivity, as in Solly Zuckerman's description of the baboons living on "Monkey Hill" in London Zoo. The unnatural crowded conditions lead to unnatural aggressiveness in the animals, in which adults killed each other and adults killed their offspring.

I suggest that human beings were in their "natural habitat" when they lived as hunter-gatherers and when agriculture was beginning. The "natural habitat" is what Bowlby, in *Attachment*, calls the EEA (the environment of evolutionary adaptedness) (Bowlby 1969, p. 50). Cultural developments such as advanced agriculture led to the environment diverging too widely from the EEA.

In a footnote in Chapter Ten Fromm calls attention to Bowlby's notion of the nature of the child's tie to the mother in the first volume of his trilogy (Bowlby 1969). In another footnote on the same page Fromm mentions the book on war that Bowlby co-authored in 1939 (Durbin and Bowlby 1939), which also discusses Zuckerman's observations.

In conclusion, Fromm's foray into the neurosciences confirmed his critical view of society: unnatural aggression in humans stems from an unnatural social environment.

Fromm applied his readings in neurophysiology also in a later work, called *Is Man Lazy by Nature?* This was written in 1974 and was meant to be a part of *To Have Or To Be?* (Fromm 1976a). It was published posthumously in Fromm (1991b). In the section on neurophysiology Fromm points out that neurophysiological evidence stresses that the human brain is spontaneously active, and not inert and in need of stimulation.

## Conclusion

Bowlby, on one side of the Atlantic (although he often went to the USA for presentations), and Arieti and Fromm, on the other side, are three English-language relational psychoanalysts who made contributions of lasting value to the integration of psychoanalysis and the neurosciences. It is essential for treatment to have solid scientific underpinnings, instead of Freud's drive theory.

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